

MODULE FEATURES

- Digital/Analog Function Network Controller.
- Environmentally sealed case and connectors.
- Stores instructions for control and monitor.
- Programmable logic for sequence of operations.
- Software compiler available.
- Controls and monitors up to 32 sub-nodes.
- Built-in timer interrupt function.
- Supports multiple, hierarchical network levels.
- Supports connections to other computers and Automatic Test Equipment.
- For control and monitoring of devices.
- 16 input points.
- 16 output points, high power DC version.
- Internal feedback for determining the status of control devices and loads.
- Internal feedback current less than 100 uA.
- Each output point is built with self short circuit protection.
- Replaces relays with solid state, electrical switching.
- Communication with 115K Baud CVC Modules.
- Input/Output signals to/from J1939 databus.
- Firmware B0 May 18, 2017 can choose between 250 K Baud J1939 and 500 K Baud J1939.
- Customer may use J1939 software ID to verify the J1939 firmware is revision B0.

STANDARD DINEX FEATURES

Network

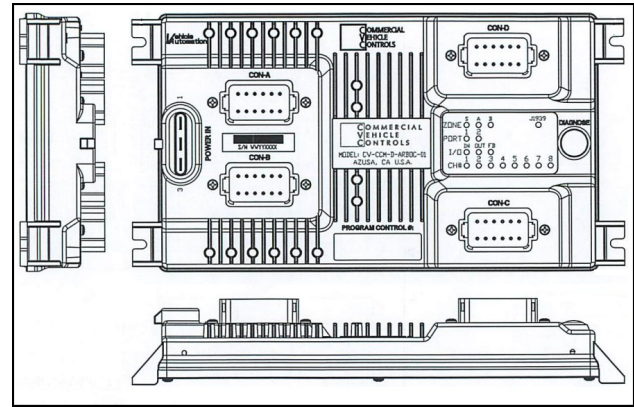
- Integrates with intelligent network control system.
- Allows system expansion.
- Easy to use and program.
- Interfaces to Personal Computers and other host computers.

Construction

- Small, compact, light weight and rugged.
- Simple to field replace.
- Built-in high speed RISC microprocessor with EEPROM.
- Designed with CMOS circuitry for low power consumption.
- Designed with CMOS and FET circuitry for low power consumption.

Multiplex Communication

- Fault tolerant RS485 data communication bus.
- 115 Kbps data communication rate.
- LED B is a status indicator during communication with subordinate module.
- 18 LED indicators provide the system status of progress revision, network connection, switch selectable to view any input, output, or feedback.
- J1939 LED will light when receiving J1939 data.



APPLICATIONS

- Main Vehicle Controller for Multiplexing Systems.
- Master Vehicle Controller replacing computers.
- Controller for on-board Self-Tests and/or connections to external Automatic Test Equipment for diagnostics.
- Interfaces to switches, such as limit switches, temperature and pressure switches, pushbutton and selector switches.
- Used for turning on and off electrical power to control devices and loads, such as solenoid valves, lights, electrical clutches, heaters and motor starters.
- Dedicated design for chassis section of multiplex application.

PRODUCT DESCRIPTION

The Chassis Controller Module (CV-CCM-D-ARBOC-01) is a network controller with power driver which provides the complete functions acting as a full-size computer. The module can be established as a Vehicle Controller which controls multiple nodes or which can directly control all input, output and feedback. The 18 indicator LED provide the capability to monitor and trouble shoot the complete Multiplex system.

The CV-CCM-D-ARBOC-01 module is a digital input and output module for on/off state devices. The module includes both inputs for monitoring switches and outputs for control devices in a very compact package. Internal feedback monitoring provides the ability to determine if a load is active, in addition to the load connection.

Each I/O point is optically isolated and with self protection against voltage spikes, transients and short circuits. The optical isolation also provides electrical noise immunity.

This module has fixed addresses 68, 69, 70, and 79. Each I/O point can be separately monitored and controlled by the built-in Cell Net Controller or computer.

OPTIONS

downlinks are available as optional.

Module

- Alternate connector types and configurations, or color coded wire pigtails.

TECHNICAL SPECIFICATIONS**General**

- Operating temperature range: -40°C to +85°C
- Humidity: 10% to 100%, saturated
- Shock: up to 20 g
- Vibration: 5 to 35 Hz, 2mm double amplitude, 2 hours

Adverse Environment

- Sealed connectors, if assembled and mated correctly, provide protection against splashing water, oil, or common solvents.

Module**Inputs**

- Input voltage: 7-16 VDC
- Reverse voltage protection: 16 VDC
- Input current at rated pick-up voltage: 5mA
- Input current at maximum voltage: 15mA
- Turn on/off time: 15 millisecond maximum

Outputs

- Load voltage: 8-16 VDC
- Continuous load output current: 1.0-10.0 Amp vary according to pin assigned.
- Leakage current at nominal load voltage: 100 uA max.
- Turn on/off time: 5 millisecond maximum
- Module Continuous Current, All Outputs Sum: 60 Amp

Module and Programming

- High speed microprocessor.
- 32000 programming lines of stack code.
- Integrated word look-up table.
- 32K byte of EEPROM.
- network data exchange registers
- 20MHz microprocessor to execute the instruction at 200 ns
- Direct control of other sub-level Cell Net Controllers.
- Built-in error detection, check sum protocol for faster operation.
- Uses Ladder Logic GUI language to generate source code, object code and system documentation. With the CV-CCM module, 32 timers and 64 flags are available for programming.

Network Linking Capability

- One uplink to higher level controller.
- Standard 16 downlinks to lower level controller and/or other CVC modules. Another extended 16

J1939 Inputs

Internal J1939 input gateway uses ID 79. This module has thirty-three fixed J1939 inputs.

HMI Switches, Input 1CA72134 (-AUXIO 2, PGN A700)
Destination Address 021h

FRONT DOOR OPEN 1CA72134 (AUX IO 2)
On = Byte 3 bit 1 = 1
Off = Byte 3 bit 1 = 0

REAR DOOR OPEN 1CA72134 (AUX IO 2)
On = Byte 4 bit 1 = 1
Off = Byte 4 bit 1 = 0

DOORS OPEN 1CA72134 (AUX IO 2)
On = Byte 3 bit 2 = 1
Off = Byte 3 bit 2 = 0

DOORS CLOSE 1CA72134 (AUX IO 2)
On = Byte 4 bit 2 = 1
Off = Byte 4 bit 2 = 0

INTERIOR LIGHTS ON 1CA72134 (AUX IO 2)
On = Byte 3 bit 3 = 1
Off = Byte 3 bit 3 = 0

INTERIOR LIGHTS ON W/DOOR 1CA72134
On = Byte 4 bit 3 = 1
Off = Byte 4 bit 3 = 0

DEPLOY 1CA72134 (AUX IO 2)
On = Byte 3 bit 4 = 1
Off = Byte 3 bit 4 = 0

STOW 1CA72134 (AUX IO 2)
On = Byte 4 bit 4 = 1
Off = Byte 4 bit 4 = 0

RAMP HEAT ON 1CA72134 (AUX IO 2)
On = Byte 3 bit 5 = 1
Off = Byte 3 bit 5 = 0

KNEEL 1CA72134 (AUX IO 2)
On = Byte 3 bit 6 = 1
Off = Byte 3 bit 6 = 0

ABS 18F00117 SPN 1438 (-EBC1)
On = Byte 6 bit 5, 6 = xx01 xxxx or 0DF
Off = Byte 6 bit 5, 6 = xx00 xxxx or 0CF

Low Air PGN 64774, 18FD0617 SPN 5089 (DLCC2)
On = Byte 1 bit 5, 6 = 01
Off = Byte 1 bit 5, 6 = 00

CVC MPX

INTELLIGENT NETWORK CONTROL SYSTEM

CV-CCM-D-ARBOC-01

Main Vehicle Controller

Service Brake PGN 65265, 18FEF117 SPN 597 (CCVS1)

On = Byte 4 bit 5, 6 = 01

Off = Byte 4 bit 5, 6 = 00

High Beam PGN 64972, 0CFDCC17 SPN 2874 (-OEL)

On = Byte 2 bit 7, 8 = 01 from Ametek Dashboard

Off = Byte 2 bit 7, 8 = 00

Headlight Switch PGN 64972, 0CFDCC17 SPN 2872

(-OEL) from Ametek Dashboard

On = Byte 1 bit 5 - 8 = 0010 or 0011

Off = Byte 1 bit 5 - 8 = 0000 or 0001

Marker Light Switch PGN 64972, 0CFDCC17 SPN

2872 (-OEL) from Ametek Dashboard

On = Byte 1 bit 5 - 8 = 0001 or 0011

Off = Byte 1 bit 5 - 8 = 0000 or 0010

CC Speed > 4.8 KPH, 3 MPH (xxFEF100) SPN 84

On = Byte 3, 2 >= 00500H

Off = Byte 3, 2 < 00500H

CC Park Brake Is On (xxFEF117) SPN 70 SA 017h

On = Byte 1 bit 3, 4 = 01 Ametek Dashboard

Off = Byte 1 bit 3, 4 = 00

Farebox Light Switch PGN 64972, 0CFDCC17

SPN 2873 (-OEL) from Ametek Dashboard

On = Byte 1 bit 1 - 4 = 0001 or 0011

Off = Byte 1 bit 1 - 4 = 0000 or 0010

Aisle Light Switch PGN 64972, 0CFDCC17 SPN 2873

(-OEL) from Ametek Dashboard

On = Byte 1 bit 1 - 4 = 0010 or 0011

Off = Byte 1 bit 1 - 4 = 0000 or 0001

Reverse Selected Gear (18F00503) Byte 1 SPN 524

(-ETC2)

On = Byte 1 < 07Dh

Off = Byte 1 >= 07DH

Reverse Current Gear (18F00503) Byte 4 SPN 523

(-ETC2)

On = Byte 4 < 07Dh

Off = Byte 4 >= 07DH

Neutral Selected Gear (18F00503) Byte 1 SPN 524

(-ETC2)

On = Byte 1 is 07Dh or 0FBh

Off = Byte 1 > 07DH, > 0FBh

Neutral Current Gear (xxF00503) Byte 4 SPN 523

(-ETC2)

On = Byte 4 is 07Dh or 0FBh (Note FB = Park)

Off = Byte 4 < > 07DH, < > 0FBh

Left Turn Switch PGN 64972, 0CFDCC17 SPN 2876

(-OEL) from Ametek Dashboard

On = Byte 2 bit 1 - 4 = 00x1

Off = Byte 2 bit 1 - 4 = 00x0

Right Turn Switch PGN 64972, 0CFDCC17 SPN 2876

(-OEL) from Ametek Dashboard

On = Byte 2 bit 1 - 4 = 001x

Off = Byte 2 bit 1 - 4 = 000x

Fast Idle PGN 65264, 18FEF017 SPN 979 (-PTO)

from Ametek Dashboard

On = Byte 6 = xxxx 01xx, 0F7H

Off = Byte 6 = xxxx 00xx, 0F3H

Engine Regen Force PGN 57344, E000 + DA = FF

“Broadcast Destination Address” from Ametek Dash

18E0FF17 SPN 3693 (-CM1)

On = Byte 6 = xxxx 01xx, 0F7H

Off = Byte 6 = xxxx 00xx, 0F3H

Engine Zone Heat Req. PGN 57344, E000 + DA = FF

“Broadcast Destination Address” from Ametek Dash

18E0FF17 SPN 1685 (-CM1)

On = Byte 7 = xx01 xxxx, 0DFH

Off = Byte 7 = xx00 xxxx, 0CFH

Circulation Pump Req. PGN 57344, E000 + DA = FF

“Broadcast Destination Address” from Ametek Dash

18E0FF17 SPN 1684 (-CM1)

On = Byte 1 = xxxx xx01, 0FDH

Off = Byte 1 = xxxx xx00, 0FCH

Transmission Engine Crank Enable PGN 65098

SPN 2900 18FE4A03 (-ETC7)

On = Byte 2 = xx01 xxxx, 0DFH

Off = Byte 2 = xx00 xxxx, 0CFH

Transmission Shift Inhibit Indicator PGN 65098

spn 1851 18FE4A03 (-ETC7)

On = Byte 2 = 01xx xxxx, 07FH

Off = Byte 2 = 00xx xxxx, 03FH

Cab Zone Heat Req. PGN 57344 E000 + DA = FF

“Broadcast Destination Address”

18E0FF17 SPN 1686 (-CM1) from Ametek Dashboard

On = Byte 7 = 01xx xxxx, 07FH

Off = Byte 7 = 00xx xxxx, 03FH

J1939 Software ID

Send to CV-CCM-D-ARBOC-01 module Software ID
Request 18EA2100 DA FE 00 00 00 00 00 00

The source address doesn't matter: 18EA21xx where xx can be any hexadecimal number.

AUGUST 14, 2018 Firmware changed to Revision B1.
Module responds 18FEDA21 01 41 52 42 4F 43 42 31
A R B O C B 1

J1939 Outputs

BRAKE IS **ON**: SPN 597 (byte 4 bit 5, 6)
For Allison B3000 Transmission.
18FEF121 33, FF, FF, **DF**, FF, FF, FF, FF

BRAKE IS **OFF**:
18FEF121 33, FF, FF, **CF**, FF, FF, FF, FF

Logic SPN 597 "Unavailable" (optional selection)
18FEF121 33, FF, FF, **FF**, FF, FF, FF, FF

ACCELERATOR INTERLOCK **ON**: SPN 972
(byte 4 bit 1, 2)
18F00121 FF, FF, FF, **FD**, FF, FF, FF, FF

ACCELERATOR INTERLOCK **OFF**:
18F00121 FF, FF, FF, **FC**, FF, FF, FF, FF

Logic SPN 972 "Unavailable" for Eaton
Transmission. (optional selection)
18F00121 FF, FF, FF, **FF**, FF, FF, FF, FF

FAST IDLE **ON**: SPN 979
(byte 6 bit 3 and 4)
18FEF021 FF, FF, FF, FF, FF, FF, **F7**, FF, FF

FAST IDLE **OFF**:
18FEF021 FF, FF, FF, FF, FF, FF, **F3**, FF, FF

Logic SEND OUT 18FEF021 FAST IDLE
PGN FEF0 (optional selection)

PARK BRAKE **ON**: SPN 70
For Allison B3000 Transmission.
18FEF121 **37**, FF, FF, CF, FF, FF, FF, CF

PARK BRAKE **OFF**:
18FEF121 **33**, FF, FF, CF, FF, FF, FF, CF

Logic SPN 70 "Unavailable" for Eaton Transmission.
(optional selection)
18FEF121 **3F**, FF, FF, CF, FF, FF, FF, FF

Turn On HMI Switches internal lights . Stow / Deploy
blue, all others yellow, 1% or 31% brightness.

18A73421 (-AUXIO 2, PGN A700) Destination
Address 034h.

1 % 18A73421 **81, 81**, 37, 37, 37, 37, 08, 08
31% 18A73421 **9F, 9F**, 37, 37, 37, 37, 08, 08

Signals For Ametek Dashboard

PARK BRAKE RELEASE INHIBIT **ON**: SPN 3807
(byte 1 bit 7 and 8)
18FEF121 **73**, FF, FF, CF, FF, FF, FF, FF

PARK BRAKE RELEASE INHIBIT **OFF**:
18FEF121 **33**, FF, FF, CF, FF, FF, FF, FF

Logic SPN 3807 "Unavailable". (optional selection)
18FEF121 **F3**, FF, FF, CF, FF, FF, FF, FF

DOOR IS **OPEN**: SPN 1821 (byte 1 bit 1, 2, 3, 4)
18FE4E21 **C0**, FF, FF, FF, FF, FF, FF, C0

DOOR IS **CLOSED**:
18FE4E21 **C2**, FF, FF, FF, FF, FF, FF, C0

RAMP IS **NOT STOWED**: SPN 1820
(byte 1 bit 5 and 6)
18FE4E21 **D0**, FF, FF, FF, FF, FF, FF, C0

RAMP IS **STOWED**:
18FE4E21 **C0**, FF, FF, FF, FF, FF, FF, C0

Logic SEND OUT 18FE4E21 (optional selection)

ADA STOP **REQUEST**: No SPN (byte 8 bit 1 and 2)
18FE4E21 C0, FF, FF, FF, FF, FF, FF, **C1**

ADA **NOT REQUESTED**:
18FE4E21 C0, FF, FF, FF, FF, FF, FF, **C0**

STOP **REQUEST**: No SPN (byte 8 bit 3 and 4)
18FE4E21 C0, FF, FF, FF, FF, FF, FF, **C4**

STOP **NOT REQUESTED**:
18FE4E21 C0, FF, FF, FF, FF, FF, FF, **C0**

RAMP **IN MOTION**: No SPN (byte 8 bit 5 and 6)
18FE4E21 C0, FF, FF, FF, FF, FF, FF, **D0**

RAMP **STATIONARY**:
18FE4E21 C0, FF, FF, FF, FF, FF, FF, **C0**

PIN ASSIGNMENT

LEFT TURN **ACTIVE**:18FE4E21 C0, FF, FF, FF, FF, FF, F**1**, C0LEFT TURN **INACTIVE**18FE4E21 C0, FF, FF, FF, FF, FF, F**0**, C0RIGHT TURN **ACTIVE**:18FE4E21 C0, FF, FF, FF, FF, FF, F**4**, C0RIGHT TURN **INACTIVE**18FE4E21 C0, FF, FF, FF, FF, FF, F**0**, C0TRANS SHIFT INHIBIT **ACTIVE**: SPN 6810C010321 F**D**, FF, FF, FF, FF, FF, FF, FFTRANS SHIFT INHIBIT **INACTIVE**0C010321 F**C**, FF, FF, FF, FF, FF, FF, FF

Logic Send Out PGN 0C010321 (Optional)

CRUISE CONTROL **ON**: SPN 59618FEF121 33, FF, FF, C**7**, CC, FF, FF, FFCRUISE CONTROL **OFF**:18FEF121 33, FF, FF, C**3**, CC, FF, FF, FFCRUISE CONTROL **SET**: SPN 59918FEF121 33, FF, FF, C**3**, C**D**, FF, FF, FFCRUISE CONTROL **X**:18FEF121 33, FF, FF, C**3**, C**C**, FF, FF, FFCRUISE CONTROL **RESUME**: SPN 60118FEF121 33, FF, FF, C**3**, C**D**, FF, FF, FFCRUISE CONTROL **X**:18FEF121 33, FF, FF, C**3**, C**C**, FF, FF, FF

Logic to make SPN 596, 599, 601 "Unavailable (Optional)

ENGINE BRAKE VGT **ON 100%**: SPN 97318F00121 FF, FF, FF, FC, F**A**, FF, FF, FFENGINE BRAKE VGT **OFF 0%**:18F00121 FF, FF, FF, FC, F**0**, FF, FF, FF

AUGUST 14, 2018 Firmware changed to Revision B1, new signal on if less than 12 volts.

< 12 Volts 18FEF700 -VEP Vehicle Electric Power

18FEF700 Byte 5 and 6 less than 0F0 Hex.

Logic to make SPN 973 "Unavailable (Optional)

Logic Master on / off to send out J1939 Signals.

NETWORK DEUTSCH DT15-12PB CON-D (BLACK)	
PIN #	FUNCTION
1	J1939 H
2	J1939 L
3	J1939 S
4	WAKEUP COM
5	BATTERY +12 V POWER 3
6	BATTERY GND INPUT
7	NETWORK DA DNET A (in)
8	NETWORK DB DNET B (in)
9	+12 V MPX
10	GND MPX
11	NETWORK CA CNET A (out)
12	NETWORK CB CNET B (out)

POWER MOLEX 42819-3212 CON-E	
PIN #	FUNCTION
1	BATTERY +12 V POWER 1 FOR CON-A
2	BATTERY GND
3	BATTERY +12 V POWER 2 FOR CON-B

CON-E Power pin 1 or pin 3 can provide reference power to CON-C through an internal diode. The ground inputs on CON-C will draw power from CON-E. Internal diodes prevent a direct connection between CON-E pin 1 and CON-E pin 3.

INPUT/OUTPUT DEUTSCH DT15-12PD CON-A (BROWN)			
PIN	FUNCTION	PIN	FUNCTION
1	OUTPUT 1 (8A)	2	INPUT 11 WAKE UP (GND)
3	OUTPUT 2 (8A)	4	OUTPUT 3 (10A)
5	INPUT 12 WAKE UP (GND)	6	OUTPUT 4 (10A)
7	OUTPUT 9 (8A)	8	INPUT 13 (GND)
9	OUTPUT 10 (1.0A GND)	10	OUTPUT 11 (1.0A GND)
11	INPUT 14 (GND)	12	OUTPUT 12 (3.5A)

INPUT/OUTPUT DEUTSCH DT15-12PA CON-B (GREY)			
PIN	FUNCTION	PIN	FUNCTION
1	OUTPUT 13 (3.5A)	2	INPUT 15 WAKE UP (GND)
3	OUTPUT 14 (3.5A)	4	OUTPUT 15 (3.5A)
5	INPUT 16 WAKE UP (GND)	6	OUTPUT 16 (10A)
7	OUTPUT 5 (8A)	8	N/A
9	OUTPUT 6 (8A)	10	OUTPUT 7 (8A)
11	N/A	12	OUTPUT 8 (8A)

INPUT/OUTPUT DEUTSCH DT15-12PC CON-C (GREEN)			
PIN	FUNCTION	PIN	FUNCTION
1	N/A	2	INPUT 1 WAKE UP (GND)
3	INPUT 2 (GND)	4	INPUT 3 (+12V)
5	INPUT 4 (GND)	6	INPUT 5 WAKE UP (+12V)
7	INPUT 6 (GND)	8	INPUT 7 WAKE UP (GND)
9	INPUT 8 (12V)	10	INPUT 9 WAKE UP (GND)
11	INPUT 10 (+12V)	12	N/A

Recommended Mating Connectors

MODULE	MATING
CON-A	Deutsch DT06-12SA
CON-B	Deutsch DT06-12SB
CON-C	Deutsch DT06-12SC
CON-D	Deutsch DT06-12SD
POWER IN	Delphi 12124685